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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,762	12/08/2003	Zhigiang Zhang	AA207/98002	3466

7590 05/23/2007  
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EXAMINER
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GOLOBOY, JAMES C

ART UNIT	PAPER NUMBER
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1714

MAIL DATE	DELIVERY MODE
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05/23/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/730,762	Applicant(s) ZHANG ET AL.	
	Examiner James Goloboy	Art Unit 1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-18 and 20-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 3-8, 11-14, 17, 18, 22-40, 42-44 and 47-61 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 2, 15-16, 20-21, 41, 45-46 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/6/07</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. All outstanding objections and rejections are overcome by applicant's amendments of 2/27/07. Objections necessitated by applicant's amendments are set forth below.

#### *Claim Objections*

2. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Amended claim 1 now recites an aspect ratio of 500 to 500 for the carbon nanomaterial. The only difference between claim 1 and claim 2 is therefore that claim 2 requires the carbon nanomaterial of claim 1 to be single-walled or multi-walled. However, the nanomaterial must be either single-walled or multi-walled by definition. Claim 2 thus fails to further limit claim 1.

3. Claim 15-16, 20-21, and 45 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 now contains the limitation that the effective amount of a carbon nanomaterial is from between 0.001 and 10% by weight. Claim 16, which recites the same limitation,

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therefore fails to further limit claim 1. Claims 15, 20-21, and 45 recite broader ranges for the concentration of the carbon nanomaterial than the range recited in claim 1 and therefore also fail to limit the parent claim.

4. Claims 41 and 46 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 recites the limitation that the dispersant has an HLB of 8 or less. It is noted that the dispersants in claims 41 and 46 are disclosed in paragraphs 50-55 of the specification, while dispersants with an HLB equal to or less than 8 are disclosed in paragraph 56 under "other types of dispersants". It is therefore the examiner's position that the dispersants of claims 41 and 46 do not have an HLB of 8 or less, and do not further limit claim 1.

#### ***Allowable Subject Matter***

5. Claims 1, 3-8, 11-14, 17-18, 22-40, 42-44, 47-61 are allowed. The closest prior art is exemplified by references such as Bonsignore and Withers that teach dispersions of carbon nanotubes in heat transfer fluid in the amount required by claim 1, in view of references such as Moy and Nikolaev that teach the aspect ratio of claim 1 and a dispersant. However, the dispersant of Withers (Triton X-100) has an HLB value of 13.4, well outside the scope of amended claim 1, and the individual dispersants disclosed in

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paragraph 31 of Nikolaev also have HLB values greater than 8. While there are individual dispersants within the broad classes disclosed by Nikolaev with HLB values below 8, there is no teaching or suggestion to lead one of ordinary skill in the art to select such a dispersant for a dispersion of carbon nanomaterials. Claims 2, 15-16, 20-21, 41, and 45-46 would also be allowable if the objections set forth in paragraphs 2-4 are remedied.

### ***Conclusion***

6. Applicant's amendment necessitated the new objections presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Goloboy whose telephone number is 571-272-2476. The examiner can normally be reached on M-F 8-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCG

*Vasu Jagannathan*  
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